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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/691,569	10/24/2003	Kensaku Motoki	33035M0342	6958
441 7590 02/11/2008 SMITH, GAMBRELL & RUSSELL 1130 CONNECTICUT AVENUE, N.W., SUITE 1130 WASHINGTON, DC 20036				
EXAMINER				
PIZARRO CRESPO, MARCOS D				
ART UNIT		PAPER NUMBER		
2814				
MAIL DATE		DELIVERY MODE		
02/11/2008		PAPER		

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

### Office Action Summary

**Application No.**

10/691,569

**Applicant(s)**

MOTOKI ET AL.

**Examiner**

Marcos D. Pizarro

**Art Unit**

2814

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 07 November 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 38, 39, 59 and 60 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 38, 39, 59 and 60 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☒ Claim(s) 38, 39, 59 and 60 are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

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Attorney's Docket Number: 033035M0342

Filing Date: 10/24/2003

Claimed Priority Dates: 4/28/2000 (Divisional of 09/560,818)

10/29/1998 (CIP of PCT/JP98/04908)

4/14/1998 (JP 102546/1998)

1/20/1998 (JP 009008/1998)

10/30/1997 (JP 298300/1997)

Applicant(s): Motoki et al.

Examiner: Marcos D. Pizarro-Crespo

### **DETAILED ACTION**

This Office action responds to the amendment filed on 11/7/2007.

#### ***Acknowledgment***

1. The amendment filed on 11/7/2007, responding to the Office action mailed on 8/7/2007, has been entered. The present Office action is made with all the suggested amendments being fully considered. Accordingly, pending in this Office action are claims 38, 39, 59, and 60.

#### ***Claim Rejections - 35 USC § 103***

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of

the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

**4. Claims 38, 39, 59, and 60 are rejected under 35 U.S.C. 103(a) as being unpatentable over IBM in view of Tischler (US5679152) and Molnar (US6086673).**

5. Regarding claims 38 and 39, IBM shows most aspects of the instant invention including a method of making a GaN crystal substrate in a growth apparatus including a reaction chamber, a gas introducing port, and a rotary support member, the method comprising: placing a GaN crystal employed as a seed crystal on the rotary support member; and forming an ingot of GaN crystal by growing an epitaxial layer made of GaN on the GaN single crystal employed as the seed crystal, while the rotary support member is at a certain distance from the gas-introducing port. See, *e.g.*, IBM: disclosure text//I.25-34. The method also comprises a cutting/cleaving step of cutting/cleaving the ingot into a plurality of sheets. See, *e.g.*, IBM: disclosure text//I.5-7,35-40,46-49). IBM also teaches that the sheets are ideally used as conducting substrates in the optoelectronics field (see, *e.g.*, disclosure text//I.1-2).

6. Tischler, on the other hand, teaches that because of their optoelectronic properties, GaN substrates are highly advantageous in the fabrication of a wide range of devices (see, *e.g.*, col.1//I.13-43). However, to effectively use these advantages of GaN, the substrate must be of single crystal character (see, *e.g.*, col.1//I.29-34).

7. It would have been obvious at the time of the invention to one of ordinary skill in the art to have a single-crystalline structure for the substrate and seed layer of IBM, as suggested by Tischler, to effectively use the advantages of a GaN substrate in the field of optoelectronics.

8. Regarding claims 38 and 39, it is noted that neither IBM nor Tischler show the exhaust port and the resistance heater. However, these are structural limitations of the apparatus in which the methods of claim 38 and 39 are carried out. It has been held that to be entitled to weight in method claims, the recited structural limitations therein must affect the method in a manipulative sense, and not amount to merely claiming applying the claimed method steps to in particular structure. *Ex parte Pfeiffer*, 1962 C.D. 408 (1961); *In re Casey*, 152 USPQ 235 (CCPA 1967); *In re Otto*, 136 USPQ 458, 459 (CCPA 1963). In the instant case, although the exhaust port and resistance heater are considered inherently present in the apparatus of IBM, these are considered structural features of the HVPE reactor that does not change the steps of the claimed method in a manipulative sense.

9. In spite of the above, Molnar shows an HVPE reactor that includes an exhaust port and a resistance heater (see, *e.g.*, fig. 1). Molnar teaches that the exhaust port would allow carrier gases, reactant gases, and growth-reaction gases to be exhausted out of the reactor chamber (see, *e.g.*, col.6/ll.33-40). In fact, Molnar teaches that the design of his exhaust port efficiently draws growth-reaction product gases away from the growth vicinity, thereby minimizing stagnation of reaction product contaminants in the vicinity of the GaN (see, *e.g.*, col.6/ll.39-44). In addition, the resistance heater

would allow selecting the temperature to create a gaseous environment that would propitiate the growth reaction of the GaN epitaxial layer (see, e.g., col.5/II.40-45).

10. Accordingly, it would have been obvious at the time of the invention to one of ordinary skill to have the heater and exhaust port of Molnar in the apparatus of IBM to minimize contaminating the GaN layer.

11. Regarding claims 59 and 60, Molnar shows the growth apparatus is a vertical furnace (see, e.g., fig. 1). IBM and Molnar both teach growing the epitaxial layer by HVPE. See, e.g., IBM/II.35 and Molnar: col.11/II.31.

### ***Response to Arguments***

12. Applicant's arguments with respect to the claims have been considered but are moot in view of the new ground(s) of rejection.

### ***Conclusion***

13. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

14. A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any

extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

15. Papers related to this application may be submitted directly to Art Unit 2814 by facsimile transmission. Papers should be faxed to Art Unit 2814 via the Art Unit 2814 Fax Center. The faxing of such papers must conform to the notice published in the Official Gazette, 1096 OG 30 (15 November 1989). The Art Unit 2814 Fax Center number is **(571) 273-8300**. The Art Unit 2814 Fax Center is to be used only for papers related to Art Unit 2814 applications.

16. Any inquiry concerning this communication or earlier communications from the examiner should be directed to **Marcos D. Pizarro-Crespo** at **(571) 272-1716** and between the hours of 10:00 AM to 8:30 PM (Eastern Standard Time) Monday through Thursday or by e-mail via [Marcos.Pizarro@uspto.gov](mailto:Marcos.Pizarro@uspto.gov). If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wael Fahmy, can be reached on (571) 272-1705.

17. Any inquiry of a general nature or relating to the status of this application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would

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like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

18. The following list is the Examiner's field of search for the present Office Action:

Field of Search	Date
U.S. Class / Subclass(es): 438/460,464,478,492-496,503-509	23/2008
Other Documentation:	
Electronic Database(s): EAST (USPAT, EPO, JPO)	2/3/2008

/Marcos D. Pizarro/

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Marcos D. Pizarro-Crespo  
Primary Patent Examiner  
Art Unit 2814  
571-272-1716  
[marcos.pizarro@uspto.gov](mailto:marcos.pizarro@uspto.gov)